# Advanced Programming

# Tutorial & Lab - Java Collection Framework

# Review Questions:

1. What is the advantage of using Collections classes or (as opposed to building your own) ?
2. When is it more suitable to use a LinkedList over an ArrayList ?
3. Which of the above will be more suitable for:
   1. List of Goods received. New entries to be added at the end reflecting the date and time of goods receipt.
   2. A text editor storing each line as an element in a list. Users are allowed to add, delete or alter any part of the document.
4. What are the differences between Map and Collection classes. What are the constraints imposed on Map?
5. What is a lambda expression? What are the uses for Lambda expressions?
6. What will be the output of the program below?

*import java.util.\*; public class MapTest1*

*{*

*public static void main(String[] args)*

*{*

*// Hasp map mapping employee number to accounts*

*Map <String, String> accountsMap = new HashMap<String, String> ();*

*accountsMap.put("E123","Charles"); accountsMap.put("E174","Matt"); accountsMap.put("E542","Brendan"); accountsMap.put("E174","Tobin"); System.out.println(accountsMap); System.out.println(accountsMap.keySet()); for (String en : accountsMap.keySet() )*

*System.out.println(accountsMap.get(en));*

*}*

*}*

1. The following program stores the employee number and first name of all the employees in the accountsMap and the quota allowed for each employee by name in the hash map quotaMap. You are required to complete the program to print the quota against each employee number. You code should use a loop and the appropriate interfaces. You may refer to the sample programs using Map. If no quota is allocated for a given account print the message “no quota yet”.

import java.util.\*; public class MapTest2

{ public static void main(String[] args)

{

// Hash map mapping employee number to accounts Map <String, String> accountsMap = new

HashMap<String,String>();

accountsMap.put("E123","Charles"); accountsMap.put("E156","Heiko"); accountsMap.put("E542","Brendan"); accountsMap.put("E174","Tobin");

Map <String, String> quotaMap =

new HashMap <String, String>();

// Hash map mapping accounts to quota quotaMap.put("Charles","5MB"); quotaMap.put("Heiko", "50MB");

quotaMap.put("Tobin", "4MB");

quotaMap.put("Bruce", "8MB");

……

}

}

1. Given Book is a subclass of Media what is wrong with the code below?

Library<Media> myMedias = new Library<Media>(); Library<Book> myBooks = new Library<Book>(); myBooks.add(new Media());

myBooks.add(new Book()); myMedias.add(new Media()); myMedias.add(new Book());

1. What is the output of the program below? Explain why.

import java.util.\*; public class TestLambda

{

public static void main(String args[])

{

String players[] = {"Jonathan","Steven","Ali","Bill"}; display(players);

Arrays.sort(players, (String s1, String s2) -> (s1.compareTo(s2)));

display(players);

Arrays.sort(players, (String s1, String s2) -> (s2.length() - s1.length()));

display(players);

Arrays.sort(players, (String s1, String s2) -> (s1.length() - s2.length()));

display(players);

}

public static void display(String players[])

{

for (int i=0; i<players.length; i++) System.out.print(players[i] + " ");

System.out.println();

}

}